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### REMARKS

Claims 1-6, 9-12, 14-30, 33-37, 40 and 42-66 are pending in the present application. Reconsideration is respectfully requested for the following reasons.

The drawings have been objected to for not containing the legend "Prior Art" in Figs. 5-7. Applicants have added the legend "Prior Art" to Figs. 5-7 and submit that the objection to the drawings is now obviated.

Claims 1, 2, 7-14, 25, 26 and 31-41 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,063,027 to Schneider. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of anticipation based upon the prior art. *In re Sun*, 31 U.S.P.Q.2d 1451, 1453 (Fed. Cir. 1993) (unpublished). Applicant respectfully asserts that the Examiner has not yet met his burden of establishing a prima facie case of anticipation with respect to the rejected claims.

Claim 1 defines a mixing head assembly including a housing having an input mix chamber passageway and an output passageway, the input mix chamber passageway communicating with the output passageway. The mixing head assembly includes a first input for injecting a first fluid into the input mix chamber passageway, the first input including a first nozzle configured to inject the first fluid into the input mix chamber passageway and a second input for injecting a second fluid into the input mix chamber passageway whereby the second fluid can mix with the first fluid to form a mixed fluid. The input mix chamber passageway includes an input annular cross section with an input axis. The outlet passageway includes an outlet annular cross section with an outlet axis. An angle between the input axis and the outlet axis is from about 89° to about 80°.

The prior art of record does not disclose or suggest the above noted features of claim 1. Applicants note that claim 1 has been amended to be substantially identical to claim 8 as originally filed. Applicants submit that the Schneider '027 patent does not disclose or suggest an input mix chamber passageway including an input annular cross section with an input axis

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In the Drawings:

The attached sheets of drawings include changes to Figs. 5-7. These sheets, which include Figs. 5-7, replace the original sheets including Figs. 5-7. In Figs. 5-7, the legend "Prior Art" has been added.

Attachment: Replacement Sheets  
Annotated Sheets Showing Changes

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and an outlet passage that includes an outlet annular cross section with an outlet axis, an angle between the input axis and the outlet axis being from about  $89^{\circ}$  to about  $80^{\circ}$ . The Schneider '027 patent discloses that the angle  $\alpha$  is significantly less than  $90^{\circ}$ . Furthermore, according to the Schneider '027 patent, the angle  $\alpha$  may be within a range of about  $30^{\circ}$  to  $60^{\circ}$  and may approximate or be  $45^{\circ}$ . Accordingly, the Schneider '027 patent teaches that significantly less than  $90^{\circ}$  is  $30^{\circ}$  to  $60^{\circ}$ , and therefore does not disclose or suggest an angle being from about  $89^{\circ}$  to about  $80^{\circ}$ . Accordingly, claim 1 is in condition for allowance.

Claims 2, 9-12 and 14 depend from claim 1, and since claim 1 defines unobvious patentable subject matter as discussed above, claims 2, 9-12 and 14 define patentable subject matter. Furthermore, in regard to claims 9 and 14, the prior art of record does not disclose or suggest an angle between an input axis and an output axis that is about  $88^{\circ}$ . As discussed above, the Schneider '027 patent discloses an angle that is  $60^{\circ}$  or less. Accordingly, the Schneider '027 patent does not disclose an angle that is  $88^{\circ}$ . Accordingly, claims 2, 9-12 and 14 are in condition for allowance.

Claim 25 defines a method of mixing a first fluid and a second fluid in a mixing head assembly comprising providing the mixing head assembly with a housing having an input mix chamber passageway and an output passageway, the input mix chamber passageway communicating with the output passageway, injecting the first fluid into the input mix chamber passageway through a first nozzle of a first input, injecting the second fluid into the input mix chamber passageway, mixing the first fluid with the second fluid to form a mixed fluid, providing the input mix chamber passageway with an input annular cross section having an input axis, providing the outlet passageway with an outlet annular cross section with an outlet axis, and angling the input axis and the outlet axis from about  $89^{\circ}$  to about  $80^{\circ}$ .

The prior art of record does not disclose or suggest the above noted features of claim 25. Specifically, as discussed above in regard to claim 1, the Schneider '027 patent does not disclose or suggest an angle being from about  $89^{\circ}$  to about  $80^{\circ}$ . Accordingly, claim 25 is in condition for allowance.

Claims 26, 33-37 and 41 depend from claim 25, and since claim 25 defines unobvious patentable subject matter as discussed above, claims 26, 33-37 and 41 define patentable subject

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matter. Furthermore, in regard to claims 33 and 40, the prior art of record does not disclose or suggest an angle being about  $88^{\circ}$ . As discussed above in regard to claim 1, the Schneider '027 patent does not disclose an angle of about  $88^{\circ}$ . Accordingly, claims 26, 33-37 and 41 are in condition for allowance.

Claims 15, 20, 21, 42, 50-53, 57 and 58 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,440,500 to Schneider. The standard for making a rejection of the claim as being anticipated under 35 U.S.C. §102 is discussed above.

Claim 15 defines a mixing head assembly comprising a housing having an input mix chamber passageway and an output passageway, the input mix chamber passageway communicating with the output passageway. The mixing head assembly includes a first nozzle for injecting a first fluid into the input mix chamber passageway and a second nozzle for injecting a second fluid into the input mix chamber passageway whereby the second fluid can mix with the first fluid to form a mixed fluid. The first nozzle is configured to inject the first fluid into the input mix chamber passageway along a first axial line. The second nozzle is configured to inject the second fluid into the input mix chamber passageway along a second axial line. The first nozzle and the second nozzle are configured to inject the first fluid and the second fluid into the input mix chamber passageway such that the first fluid and the second fluid meet at an intersection point and wherein the first axial line and the second axial line are not co-linear, wherein a line perpendicular to the first axial line is not parallel to a longitudinal axis of the input mix chamber passageway and a line perpendicular to the second axial line is not parallel to the longitudinal axis of the input mix chamber passageway and wherein the intersection point is not located along the longitudinal axis of the input mix chamber passageway.

The prior art of record does not disclose or suggest the above noted features of claim 15. Specifically, the prior art of record does not disclose or suggest the features of claim 15, wherein a line perpendicular to a first axial line is not parallel to a longitudinal axis of the input mix chamber passageway and a line perpendicular to the second axial line is not parallel to a longitudinal axis of the input mix chamber passageway. As illustrated in Fig. 4 of the Schneider '500 patent, the orifice 52 and 53 and the nozzle 62 and 64 inject fluid along a

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horizontal line. All of these lines are parallel to a line perpendicular to the longitudinal axis of the elements defined by the Examiner as being the input mix chamber passageway of the Schneider '500 patent. Accordingly, the Schneider '500 patent discloses that the lines of injected fluid of the Schneider '500 patent are parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway as defined in the Office Action. Accordingly, claim 15 is in condition for allowance.

Furthermore, claims 20 and 21 depend from claim 15, and since claim 15 defines unobvious patentable subject matter as discussed above, claims 20 and 21 define patentable subject matter. Moreover, in regard to claim 21, the prior art of record does not disclose or suggest a mixing chamber piston rod located in the input mix chamber passageway configured to slide within the input mix chamber passageway to push all of the mixed fluid in all of the input mix chamber passageway and into the outlet passageway. The Office Action has interpreted the Schneider '500 patent as including an input mix chamber passageway comprising the mixing chamber 22 and the aftermixer chamber 32 of the Schneider '500 patent. However, the Schneider '500 patent does not include a rod that slides within the input mix chamber passageway to push all of the mixed fluid in all of the input mix chamber passageway out of the input mix chamber passageway. Accordingly, claims 15, 20 and 21 are in condition for allowance.

Claim 42 defines a method of mixing a first fluid and a second fluid and a mixing head assembly comprising providing the mixing head assembly with a housing having an input mix chamber passageway and an output passageway, the input mix chamber passageway communicating with the output passageway, injecting the first fluid along a first axial line into the input mix chamber passageway through a first nozzle, injecting the second fluid along a second axial line into the input mix chamber passageway through a second nozzle, mixing the first fluid with the second fluid to form a mixed fluid at an intersection point, positioning the first axial line and the second axial line along lines that are not co-linear, positioning the first axial line and the second axial line to be non-parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway, and positioning the intersection point at a position spaced from the longitudinal axis of the input mix chamber passageway.

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The prior art of record does not disclose or suggest the above noted features of claim 42. Specifically, the prior art of record does not disclose or suggest the features of claim 42, and including positioning the first axial line and the second axial line to be non-parallel to a line perpendicular to the longitudinal axis of the input mix chamber passageway. As illustrated in Fig. 4 of the Schneider '500 patent, the orifice 52 and 53 and the nozzle 62 and 64 inject fluid along a horizontal line. All of these lines are parallel to a line perpendicular to a longitudinal axis of the elements defined by the Examiner as being the input mix chamber passageway of the Schneider '500 patent. Accordingly, the Schneider '500 patent discloses that the lines of injected fluid of the Schneider '500 patent are parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway as defined in the Office Action. Accordingly, claim 42 is in condition for allowance.

Furthermore, claims 50-53 depend from claim 42, and since claim 42 defines unobvious patentable subject matter as discussed above, claims 50-53 define patentable subject matter. Moreover, in regard to claim 42, the prior art of record does not disclose or suggest a mixing chamber piston rod located in the input mix chamber passageway configured to slide within the input mix chamber passageway to push all of the mixed fluid in all of the input mix chamber passageway and into the outlet passageway. The Office Action has interpreted the Schneider '500 patent as including an input mix chamber passageway comprising the mixing chamber 22 and the aftermixer chamber 32 of the Schneider '500 patent. However, the Schneider '500 patent does not include a rod that slides within the input mix chamber passageway to push all of the mixed fluid in all of the input mix chamber passageway out of the input mix chamber passageway. Accordingly, claims 42 and 50-53 are in condition for allowance.

Claim 57 defines a mixing head assembly comprising a housing having a passageway, a first nozzle for injecting a first fluid into the passageway and a second nozzle for injecting a second fluid into the passageway whereby the second fluid can mix with the first fluid to form a mixed fluid. The first nozzle is configured to inject the first fluid into the passageway along a first axial line. The second nozzle is configured to inject the second fluid into the passageway along a second axial line. The first nozzle and the second nozzle are configured to

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inject the first fluid and the second fluid into the passageway such that the first fluid and the second fluid meet at an intersection point wherein the first axial line and the second axial line are not co-linear, wherein a line perpendicular to the first axial line is not parallel to a longitudinal axis of the input mix chamber passageway, a line perpendicular to the second axial line is not parallel to the longitudinal axis of the input mix chamber passageway, and the intersection point is not located along the longitudinal axis of the passageway.

The prior art of record does not disclose or suggest the above noted features of claim 57. Specifically, the prior art of record does not disclose or suggest the features of claim 57, wherein a line perpendicular to a first axial line is not parallel to a longitudinal axis of the input mix chamber passageway and a line perpendicular to the second axial line is not parallel to a longitudinal axis of the input mix chamber passageway. As illustrated in Fig. 4 of the Schneider '500 patent, the orifice 52 and 53 and the nozzle 62 and 64 inject fluid along a horizontal line. All of these lines are parallel to a line perpendicular to a longitudinal axis of the elements defined by the Examiner as being the input mix chamber passageway of the Schneider '500 patent. Accordingly, the Schneider '500 patent discloses that the lines of injected fluid of the Schneider '500 patent are parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway as defined in the Office Action.

Claim 58 defines a method of mixing a first fluid and a second fluid in a mixing head assembly comprising providing the mixing head assembly with a housing having a passageway, injecting the first fluid along a first axial line into the passageway through a first nozzle, injecting the second fluid along a second axial line into the passageway through a second nozzle, mixing the first fluid with the second fluid to form a mixed fluid at an intersection point, positioning the first axial line and the second axial line along lines that are not co-linear, positioning the first axial line and the second axial line to be non-parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway and positioning the intersection point at a position spaced from the longitudinal axis of the passageway.

The prior art of record does not disclose or suggest the above noted features of claim 58. Specifically, the prior art of record does not disclose or suggest the features of claim 58, and including positioning the first axial line and the second axial line to be non-parallel to a

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line perpendicular to the longitudinal axis of the input mix chamber passageway. As illustrated in Fig. 4 of the Schneider '500 patent, the orifice 52 and 53 and the nozzle 62 and 64 inject fluid along a horizontal line. All of these lines are parallel to a line perpendicular to a longitudinal axis of the elements defined by the Examiner as being the input mix chamber passageway of the Schneider '500 patent. Accordingly, the Schneider '500 patent discloses that the lines of injected fluid of the Schneider '500 patent are parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway as defined in the Office Action. Accordingly, claim 58 is in condition for allowance.

Claim 54 has been rejected under 35 U.S.C. §103(a) as being unpatentable over the Schneider '500 patent in view of U.S. Patent No. 4,115,299 to Mühle. In order to establish a prima facie case of obviousness, three basic criteria must be met, according to the Manual of Patent Examining Procedure, §706.02(j). These three are repeated as follows. Firstly, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Secondly, there must be a reasonable expectation of success. Thirdly, the prior art reference (or references) must teach or suggest all the claim limitations. Applicant respectfully asserts that the Examiner has not met his burden of establishing a prima facie case of obviousness with respect to the rejected claims. Consequently, the rejection of the subject claims is inappropriate, and should be withdrawn.

Claim 54 depends from claim 42 and further defines the first fluid as being polyol and the second fluid as being isocyanate. Claim 54 depends from claim 42, and since claim 42 defines unobvious patentable subject matter as discussed above, claim 54 is in condition for allowance. Accordingly, claim 54 is in condition for allowance.

Claims 16-19, 22-24, 43-49, 55 and 56 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the Schneider '500 patent in view of the Schneider '027 patent. The standard for making a rejection under 35 U.S.C. §103(a) is outlined above.

In regard to the first criterion of obviousness, there is no suggestion or motivation, either in the references themselves or to the knowledge generally available to one of ordinary skill in the art to combine the Schneider '500 patent with the Schneider '027 patent. The



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Schneider '500 patent includes a mixing apparatus having a mixing chamber on one side of a transfer dispense chamber 12 and an aftermixer chamber 32 on the other side of the transfer dispense chamber 12. The Schneider '500 patent discloses that the mixing chamber 32 and the aftermixer chamber 22 are both disposed at right angles to the transfer dispensing chamber 12. See lines 11-13 and lines 27-31 of column 3. Accordingly, the Schneider '500 patent teaches that these chambers must be at right angles to each other and teaches away from angling such chambers. Furthermore, in such a combination, either the mixing chamber 22 or the aftermixing chamber 32 would undergo a change in direction of less than  $90^\circ$  as the angle  $\alpha$  between one of the two chambers and the transfer dispense chamber 12 would be greater than  $90^\circ$ . Applicant submits that the Schneider '500 patent and the Schneider '027 patent teach against any such combination as set forth in the Office Action as the fluid in either the mixing chamber 22 or the aftermixer chamber 32 would travel directly down the transfer dispense chamber 12 without mixing, thereby providing a substantially inefficient system. Applicants submit that such an inefficient system is the reason why the Schneider '500 patent states that the angles must be at  $90^\circ$ . Accordingly, Applicants submit that claims 16-19, 22-24, 43-49, 55 and 56 are in condition for allowance.

Furthermore, claims 16-19 and 22-24 depend from claim 15, and since claim 15 defines unobvious patentable subject matter as discussed above, claims 16-19 and 22-24 define patentable subject matter. Moreover, in regard to claims 18, 19, 23 and 24, Applicants submit that there is no suggestion or motivation for providing the angles claimed in these claims as discussed above in regard to claims 1, 9 and 14. Accordingly, claims 16-19 and 22-24 are in condition for allowance.

Furthermore, claims 43-49 depend from claim 42, and since claim 42 defines unobvious patentable subject matter as discussed above, claims 43-49 define patentable subject matter. Furthermore, in regard to claims 43-49 define patentable subject matter. Furthermore, in regard to claims 45, 46, 48 and 49, Applicants submit that there is no suggestion or motivation for providing the angles claimed in these claims as discussed above in regard to claims 1, 9 and 14. Accordingly, claims 43-49 are in condition for allowance.

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Claim 55 defines a mixing head assembly comprising a housing having an input mix chamber passageway and an output passageway, the input mix chamber passageway communicating with the output passageway. A first nozzle injects a first fluid into the input mix chamber passageway. The first nozzle is configured to inject the first fluid into the input mix chamber passageway along a first axial line. A second nozzle injects a second fluid into the input mix chamber passageway whereby the second fluid can mix with the first fluid to form a mixed fluid. The second nozzle is configured to inject the second fluid into the input mix chamber passageway along a second axial line. The input mix chamber passageway is non-perpendicular to the output passageway. The first nozzle and the second nozzle are configured to inject the first fluid and the second fluid into the input mix chamber passageway such that the first fluid and the second fluid meet at an intersection point. The first axial line and the second axial line are not co-linear. A line perpendicular to the first axial line is not parallel to a longitudinal axis of the input mix chamber passageway. A line perpendicular to the second axial line is not parallel to the longitudinal axis of the input mix chamber passageway. The intersection point is not located along the longitudinal axis of the input mix chamber passageway.

The prior art of record does not disclose or suggest the above noted features of claim 55. First, Applicants submit that there is no suggestion or motivation for combining the Schneider '500 patent with the Schneider '027 patent as discussed above. Specifically, the prior art of record does not disclose or suggest the features of claim 55, wherein a line perpendicular to a first axial line is not parallel to a longitudinal axis of the input mix chamber passageway and a line perpendicular to the second axial line is not parallel to a longitudinal axis of the input mix chamber passageway. As illustrated in Fig. 4 of the Schneider '500 patent, the orifice 52 and 53 and the nozzle 62 and 64 inject fluid along a horizontal line. All of these lines are parallel to a line perpendicular to a longitudinal axis of the elements defined by the Examiner as being the input mix chamber passageway of the Schneider '500 patent. Accordingly, the Schneider '500 patent discloses that the lines of injected fluid of the Schneider '500 patent are parallel to a line perpendicular to a longitudinal axis of the input mix

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chamber passageway as defined in the Office Action. Accordingly, claim 55 is in condition for allowance.

Claim 56 defines a method of mixing polyol and isocyanate in a mixing head assembly comprising providing the mixing head assembly with a housing having an input mix chamber passageway and an output passageway. The input mix chamber passageway communicates with the output passageway. The input mix chamber passageway is angled relative to the output passageway at a non-perpendicular angle. The polyol is injected along a first axial line into the input mix chamber passageway through a first nozzle. The isocyanate is injected along a second axial line into the input mix chamber passageway through a second nozzle. The polyol is mixed with the isocyanate to form polyurethane foam at an intersection point. The first axial line and the second axial line are positioned along lines that are not co-linear. The first axial line and the second axial line are positioned to be non-parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway. The intersection point is positioned at a position spaced from the longitudinal axis of the input mix chamber passageway.

The prior art of record does not disclose or suggest the above noted features of claim 56. First, Applicants submit that there is no suggestion or motivation for combining the Schneider '500 patent with the Schneider '027 patent as outlined above. Second, the prior art of record does not disclose or suggest the features of claim 56, and including positioning a first axial line and a second axial line to be non-parallel to a line perpendicular to the longitudinal axis of the input mix chamber passageway. As illustrated in Fig. 4 of the Schneider '500 patent, the orifice 52 and 53 and the nozzle 62 and 64 inject fluid along a horizontal line. All of these lines are parallel to a line perpendicular to a longitudinal axis of the elements defined by the Examiner as being the input mix chamber passageway of the Schneider '500 patent. Accordingly, the Schneider '500 patent discloses that the lines of injected fluid of the Schneider '500 patent are parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway as defined in the Office Action. Accordingly, claim 56 is in condition for allowance.

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Claims 3-6 and 27-30 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the Schneider '027 patent in view of the Schneider '500 patent. The standard for making a rejection under 35 U.S.C. §103(a) is outlined above. First, Applicants submit that there is no suggestion or motivation for combining the Schneider '027 patent with the Schneider '500 patent as outlined above in the discussion regarding claims 16-19, 22-24, 43-49, 55 and 56. Furthermore, claims 3-6 depend from claim 1, and claims 27-30 depend from claim 26. As outlined above, claims 1 and 26 define patentable subject matter. Accordingly, claims 3-6 and 27-30 define patentable subject matter and are in condition for allowance.

Furthermore, in regard to claims 4 and 5, the prior art of record does not disclose or suggest a mixing head assembly wherein a line perpendicular to the first axial line is not parallel to a longitudinal axis of the input mix chamber passageway and a line perpendicular to the second axial line is not parallel to the longitudinal axis of the input mix chamber passageway. As discussed above in regard to claim 15, neither the Schneider '027 patent nor the Schneider '500 patent disclose or suggest a mixing head assembly wherein the first axial line is not parallel to a line perpendicular to the longitudinal axis of the input mix chamber passageway and the second axial line is not parallel to a line perpendicular to the longitudinal axis of the input mix chamber passageway. Accordingly, claims 4 and 5 are in condition for allowance.

Moreover, in regard to claims 28 and 29, the prior art of record does not disclose or suggest a method of mixing including positioning the first axial line and the second axial line to be non-parallel to a line perpendicular to a longitudinal axis of the input mix chamber passageway. Specifically, neither the Schneider '027 patent nor the Schneider '500 patent include a method of mixing including positioning the first axial line and the second axial line to be non-parallel to a line perpendicular to the longitudinal axis of the input mix chamber passageway. Accordingly, claims 28 and 29 are in condition for allowance.

New claims 59-66 are believed to define patentable subject matter. Specifically, Applicants submit that the prior art of record does not disclose or suggest a first nozzle configured to inject a first fluid to mix with a second fluid before either the first fluid or the

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second fluid enters the output passageway, a first nozzle and a second nozzle that join an input mix chamber passageway in an area of the input mix chamber passageway that has a single diameter, moving a mixture of a first fluid and a second fluid to an output passageway, wherein the mixing of the first fluid and the second fluid takes place before moving the mixture or joining a first nozzle and a second nozzle in an area of an input mix chamber passageway having a single diameter. Accordingly, Applicants submit that claims 59-66 are in condition for allowance.

All pending claims 1-6, 9-12, 14-30, 33-37, 40 and 42-66 are believed to be in condition for allowance, and a Notice of Allowability is therefore earnestly solicited.

Respectfully submitted,

8/18/05  
Date

Marcus P. Dolce  
Marcus P. Dolce, Registration No. 46 073  
Price, Heneveld, Cooper, DeWitt & Litton, LLP  
695 Kenmoor, S.E.  
Post Office Box 2567  
Grand Rapids, Michigan 49501  
(616) 949-9610

MPD/msj

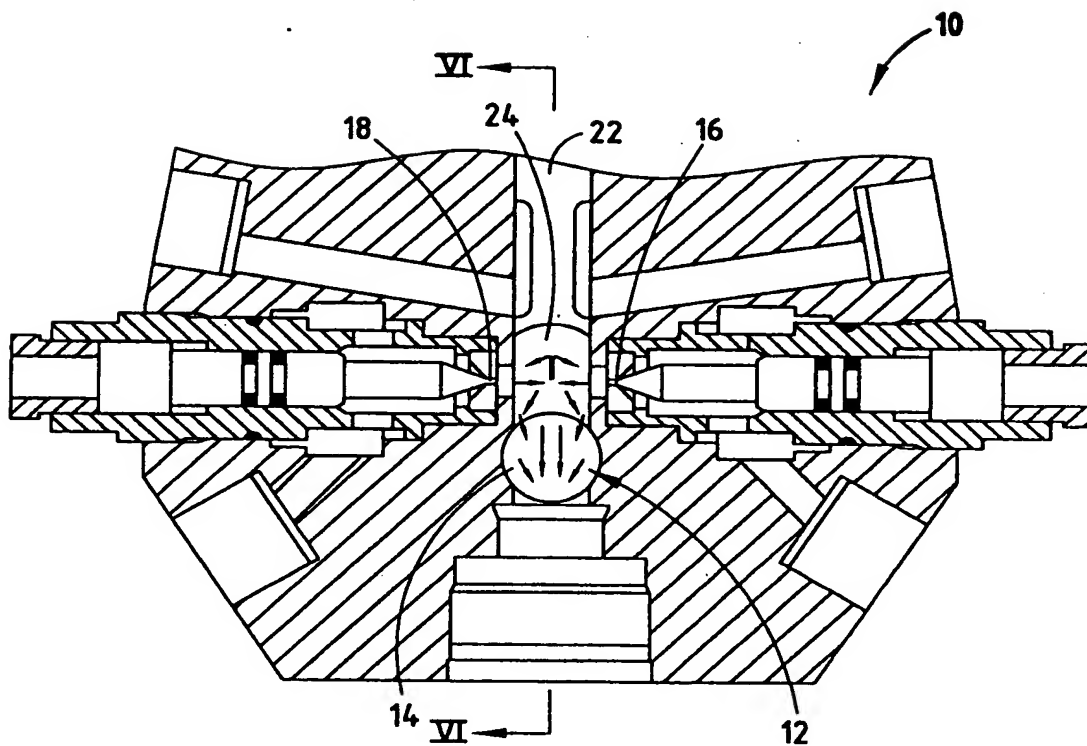


FIG. 5

Prior Art

Prior Art  
legend added

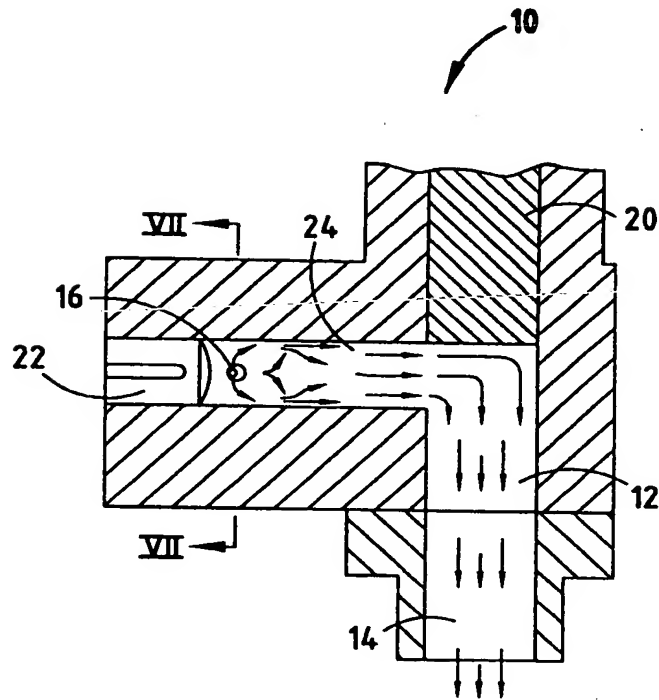


FIG. 6

Prior Art

Prior Art  
legend added

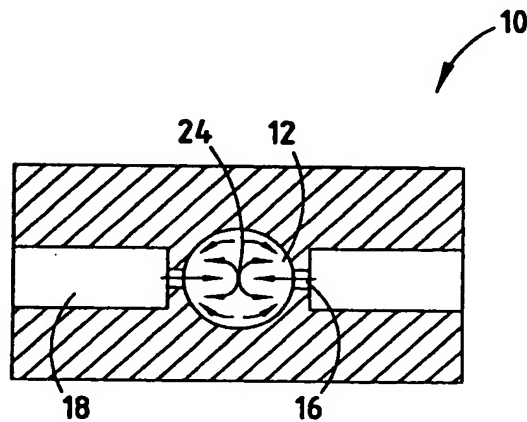


FIG. 7

Prior Art

Prior Art  
legend added